

A. Section 3161 of the National Defense Authorization Act for Fiscal Year 1993

(Public Law 102-484, Oct. 23, 1992)

Subtitle E—Defense Nuclear Workers

**SEC. 3161 DEPARTMENT OF ENERGY DEFENSE NUCLEAR FACILITIES
WORK FORCE RESTRUCTURING PLAN**

(a) **In General.**—Upon determination that a change in the work force at a defense nuclear facility is necessary, the Secretary of Energy (hereinafter in this subtitle referred to as the “Secretary”) shall develop a plan for restructuring the work force for the defense nuclear facility that takes into account—

- (1) the reconfiguration of the defense nuclear facility; and
- (2) the plan for the nuclear weapons stockpile that is the most recently prepared plan at the time of the development of the plan referred to in this subsection.

(b) **Consultation.**—

- (1) In developing a plan referred to in subsection (a) and any updates of the plan under subsection (e), the Secretary shall consult with the Secretary of Labor, appropriate representatives of local and national collective-bargaining units of individuals employed at Department of Energy defense nuclear facilities, appropriate representatives of departments and agencies of State and local governments, appropriate representatives of State and local institutions of higher education, and appropriate representatives of community groups in communities affected by the restructuring plan.
- (2) The Secretary shall determine appropriate representatives of the units, governments, institutions, and groups referred to in paragraph (1).

(c) **Objectives.**—In preparing the plan required under subsection (a), the Secretary shall be guided by the following objectives:

- (1) Changes in the work force at a Department of Energy defense nuclear facility—
 - (A) should be accomplished so as to minimize social and economic impacts; should be made only after the provision of notice of such changes not later
 - (B) than 120 days before the commencement of such changes to such employees and the communities in which such facilities are located; and
 - (C) should be accomplished, when possible, through the use of re-training, early retirement, attrition, and other options that minimize layoffs.
- (2) Employees whose employment in positions at such facilities is terminated shall, to the extent practicable, receive preference in any hiring of the Department of Energy (consistent with applicable employment seniority plans or practices of the Department of Energy and with section 3152 of the National Defense Authorization Act for Fiscal Years 1990 and 1991 (Public Law 101-189; 103 Stat. 1682)).
- (3) Employees shall, to the extent practicable, be retrained for work in environmental restoration and waste management activities at such facilities or other facilities of the Department of Energy.

- (4) The Department of Energy should provide relocation assistance to employees who are transferred to other Department of Energy facilities as a result of the plan.
- (5) The Department of Energy should assist terminated employees in obtaining appropriate retraining, education, and reemployment assistance (including employment placement assistance).
- (6) The Department of Energy should provide local impact assistance to communities that are affected by the restructuring plan and coordinate the provision of such assistance with—
 - (A) programs carried out by the Department of Labor pursuant to the Job Training Partnership Act (29 U.S.C. 1501 et seq.);
 - (B) programs carried out pursuant to the Defense Economic Adjustment, Diversification, Conversion, and Stabilization Act of 1990 (Part D of Public Law 101-510; 10 U.S.C. 2391 note); and
 - (C) programs carried out by the Department of Commerce pursuant to title IX of the Public Works and Economic Development Act of 1965 (42 U.S.C. 3241 et seq.).

(d) **Implementation.**—The Secretary shall, subject to the availability of appropriations for such purpose, work on an ongoing basis with the representatives of the Department of Labor, work force bargaining units, and States and local communities in carrying out a plan required under subsection (a).

e) **Plan Updates.**—Not later than one year after issuing a plan referred to in subsection (a) and on an annual basis thereafter, the Secretary shall issue an update of the plan. Each updated plan under this subsection shall—

- (1) be guided by the objectives referred to in subsection (c), taking into any changes in the function or mission of the Department of Energy defense nuclear facilities and any other changes in circumstances that the Secretary determines to be relevant;
- (2) contain an evaluation by the Secretary of the implementation of the plan during the year preceding the report; and
- (3) contain such other information and provide for such other matters as the Secretary determines to be relevant.

(f) **Submittal to Congress.**—

- (1) The Secretary shall submit to Congress a plan referred to in subsection (a) with respect to a defense nuclear facility within 90 days after the date on which a notice of changes described in subsection (c)(1)(B) is provided to employees of the facility, or 90 days after the date of the enactment of this Act, whichever is later.
- (2) The Secretary shall submit to Congress any updates of the plan under subsection (e) immediately upon completion of any such update.

B. Background Literature

Workplace stress

What is work stress?

In a 1992 survey by Northwestern National Life Insurance Co., four out of 10 employees (40%) indicated that their jobs were "very" or "extremely stressful." The report, along with numerous similar corporate and public opinion surveys, found that the workplace is a significant source of stress for working Americans. The causes of such stress range from the anxieties produced by corporate downsizing, to factors that result in physical disorders such as carpal tunnel syndrome, to harassment and violence in the workplace, to tensions from or between work and home.

Although there is popular recognition and acceptance that work stress adversely impacts a workforce, there is much less agreement about what stress is, how it operates to impact health, and what aspects of health are actually affected by it. There are also problems with definition and taxonomy. Stress has been considered as an environmental condition, as an appraisal of an environmental condition, as a response to an environmental condition, and as a form of relationship between environmental demands and a person's abilities to meet the demands. Although there is much controversy about the epistemology of stress, there is agreement that it is a complex phenomenon related to health, in which the psycho-physiologic pathways between stressors and health outcomes are uncertain.

Stressors refer to the experiences, physical and psychological, that give rise to stress and include both events and chronic strains (Pearlin, 1989). While events may have direct effects on stress outcomes, they also produce indirect effects, or strains, in a particular system. In considering workplace-related stress, one must recognize that stressors may occur on multiple levels. For example, stressors may act at the job or individual level. In this setting, schedule, work pace, the physical work environment, and job content all can affect the worker. Stressors, such as role ambiguity, organizational structure (hierarchy), and lack of employee involvement, operate at the organizational level affecting the individual. Extra-organizational stressors, such as a globalizing economy and resultant job insecurity or downsizing, affect the individual through the constant representation of economic transformation in the mass media and the reality of competitive markets. Lastly, the impact of non-work stressors on working individuals, such as home life, children, and working spouses, appears to be growing.

How does stress influence health?

Each of these "classes" of stressors influence the stress process. While there is concurrence that these factors affect health, there is little agreement as to the method of their effect, the mode of interaction with each other, and ultimately what each represents and how to measure them.

Work stress research has attempted to examine the issues of cause, relationship, mechanism, and outcome. Investigators have described many environmental factors believed to be stressors such as overtime, shift work, and unemployment as well as psychosocial concepts such as overload, role conflict, and role ambiguity. Kasl has

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attempted to characterize the essential elements of stressful work (Kasl, 1987). His taxonomy includes the following:

- a) Tends to be chronic rather than intermittent.
- b) There is external pacing of work demands by machines, payment mechanisms, or competition.
- c) Habituation or adaptation to the chronic situation is difficult and some sort of vigilance or arousal must be maintained.
- d) A failure to meet demands leads to adverse consequences.
- e) There is a spillover from work role to other areas of functioning.

This classification does not clarify the etiologic and mechanistic dynamic of stress.

Much research has been oriented toward developing an integrated model of stress that is capable of identifying and predicting which characteristics of work are stressful. This research, conducted over the last 40 years, contains two similar but distinct theoretical models. These two theories have attempted to integrate stress models from cognitive psychology and physiology.

What are the models for studying stress?

The Person-Environment (P-E) Fit Model, was developed in the early 1970s. Its main premise is that strain develops when there is a discrepancy between the demands of the job and the abilities of the person to meet those demands (demand-ability dimension), or between the motives of the person and the environmental supplies to satisfy the person's motives (motive-supply dimension) (Caplan, et al., 1975). Dimensions measured include workload and job complexity. Motives include income, participation, and self-utilization. Supplies refer to job benefits such as income sufficient to satisfy the motives of the individual.

The model distinguishes the objective environment and person from the subjective environment and person, where subjective refers to the perceptions of the individual. Strain then arises due to poor fit between the subjective person and the subjective environment. The major emphasis of the P-E Fit model is on the subjective perception. The model does not acknowledge the role of objective workplace stressors other than their influence on a worker's perceptions. Some researchers have criticized the P-E Fit model because of its limited ability to predict what work conditions are likely to result in stress.

The Job Demand-Control (D-C) Model posits that strain results from the characteristics of work, rather than from subjective perceptions of the individual worker (Karasek, 1979). Strain arises as the result of imbalance between demands and decision latitude (control) in the workplace, where lack of control is seen as an environmental constraint on an individual's response capabilities. The control dimension consists of two components that are usually highly correlated in job situations: personal control over decision making, and skill level and variety. In contrast to other models of job stress, the D-C model emphasizes that psychologically demanding situations alone do not cause adverse reactions of being stressed. Instead, a major factor is whether the individual has control over his or her actions in meeting demands. The D-C Model recognizes that the essential characteristics of a stressful work environment are that it simultaneously places demands and creates environmental constraints on an individual's response capabilities. The stressful work

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environment highlights the imbalance between the demand and the response that leads to strain.

The D-C Model characterizes jobs by their combination of demand and control. For example, jobs with high demand and low control (waiters, VDT operators, and machine-paced workers) have high strain. These jobs typically have a high division of labor and a de-skilling of tasks. D-C researchers have demonstrated that jobs with high demand and high control have low strain.

This model, also known as the "job strain" model (as developed by R. Karasek) states that the greatest risk to physical and mental health from stress occurs to workers facing high psychological workload demands or pressures combined with low control or decision latitude in meeting those demands. Job demands are defined by questions such as "working very fast," "working very hard," and not "enough time to get the job done." Job decision latitude is defined as the ability to use skills on the job as well as the decision-making authority available to the worker. The "job strain" model emphasizes the interaction between demands and control in causing stress, and objective constraints on action in the work environment, rather than individual perceptions or "person-environment fit."

A number of computational forms of job strain have been used in the job strain literature (Schnall and Landsbergis, 1994). As will be described later, this study uses a quotient term (demands divided by latitude) to operationalize job strain.

Why study work stress?

The issue of job stress is of utmost importance to the public health community and working people. The economic costs of job stress in general (absenteeism, lost productivity) are difficult to estimate. As already mentioned, the health and financial impact of job stress has attracted the attention of corporate and public opinion researchers. A 1997 survey by Princeton Survey Research Associates found that "three-fourths of employees believe the worker has more on-the-job stress than a generation ago." A 1992 report by the St. Paul Fire and Marine Insurance Company concluded: "Problems at work are more strongly associated with health complaints than are any other life stressor-more so than even financial problems or family problems."

Job insecurity and health

Ferrie and the Whitehall group (studying British Civil Servants in a longitudinal study for over twenty years) in a 1998 article examined changes in the health status of British civil servants whose employment security was threatened (Ferrie, et al., 1998). As part of the ongoing Whitehall study, these researchers measured self-reported morbidity and physiological risk factors among workers in departments threatened with reorganization and downsizing compared with those from other departments that were not threatened. This longitudinal study demonstrated an adverse trend in self-reported morbidity as well as for physiological measurements such as cholesterol and anginal pain. These changes were not explained by changes in health-related behaviors among the subjects. This article demonstrated that the anticipation of job loss was associated with significant changes in self-reported complaints and physiologic parameters.

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Downsizing literature

Downsizing, or large-scale layoffs, has been adopted over the last decade as a management tool with the purported aim of strengthening a company by means of reducing budgets and personnel.

Initial studies indicate that there may be significant organizational repercussions after a downsizing. A study by the American Management Association showed that 40% of organizations responding reported that productivity had sagged after downsizing, and nearly one fifth reported that quality had suffered. This study also documented a decline in morale (reported by 58% of companies) and greater employee turnover (American Management Association, October 26, 1999). As the economy improves, retention will become an even bigger issue.

What are the effects of downsizing on employees?

Within the field of psychology, David Noer has looked at outcomes from downsizing, with a focus on individual responses. Major findings include fear, insecurity, frustration and anger, sadness and depression, sense of unfairness, reduced risk-taking, and lowered productivity. Noer and others call this compilation of symptoms "survivor syndrome," a syndrome originally identified in studies of survivors of Hiroshima/Nagasaki and the Holocaust (Noer, 1993). A follow-up study of organizations implementing layoffs found that many of these symptoms persisted for five years although employees had become resigned to the outcomes (Noer, 1993). Henkoff also reported fear and anxiety, as reactions to downsizing as well as employees' concerns that they may be the next to lose their jobs (Henkoff, 1994). Sommer and Luthans found a decrease in organizational commitment, in trust among coworkers, and in job satisfaction following a downsizing event at a health care organization (Sommer and Luthans, 1999).

A few studies (summarized in Sommer and Luthans, 1999) found negative personal and job outcomes associated with downsizing. One study (Cameron, et al., 1993) found significant associations between downsizing and decreased morale and between downsizing and increased conflict in the workplace. Another study found negative impacts on interpersonal relationships, physical health, and emotional health (Kozlowski, et al., 1993)

Parker and colleagues studied the effect of strategic or planned downsizing on employee job satisfaction and job-related strain (Parker, et al., 1997). Employees in a company that had introduced planned employment changes were followed over a four-year period. Although measured demand increased, well-being and job satisfaction did not decrease. The authors concluded that the managed strategic downsizing actually improved employees' sense of control because of new work characteristics introduced as part of the reorganization. Therefore, the authors conclude, downsizing that is planned and not reactive and that includes employee involvement does not necessarily lead to adverse outcomes.

Finally, Woodward and colleagues measured changes in employee health and organizational function in a longitudinal study of a Canadian teaching hospital undergoing "re-engineering" and downsizing (Woodward, et al., 1999). The authors reported that measures of worker emotional health deteriorated, job demands increased

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and coworker support decreased, and work distress spilled over into the out-of-work lives of many of the study participants. These employees participated in many of the planning activities for the organizational changes and downsizing. However, in contrast to the Parker study, Woodward reports significant health impacts on employees resulting from the planned and strategic changes.

Joel Brockner writes of varying relationships between job insecurity and productivity, with mild levels of insecurity enhancing productivity (Brockner, 1988). He discusses survivor syndrome in terms of its impact on relationships and organizations. Brockner writes extensively about fairness and reports that how employees react to a downsizing event is related to their perceptions of how fair and justified the action was (Brockner, et al., 1995).

Justice and fairness in the workplace

Research shows that perceptions of fairness are important in the workplace and should be considered as an independent variable when analyzing organizational functioning and health (Folger, 1987; Alexander and Ruderman, 1987; Fryxell, 1992; and Greenberg, 1990). Robert Folger discusses the cognition theory of justice in which employees are more likely to be resentful of an outcome if they believe there was a more fair or ethical way to achieve the outcome. Alexander and Ruderman found a significant association between perceptions of fairness and job-related attitudes of workers (Alexander and Ruderman, 1987). Both Fryxell and Greenberg see that justice is a complex concept and compare distributive and procedural justice. Distributive justice is concerned with the allocation of rewards and resources in an equitable manner (Niehoff and Moorman, 1993). Procedural justice focuses on whether employees believe that policies and procedures are determined and implemented in a fair and consistent manner (Niehoff and Moorman, 1993).

Greenberg cites a 1987 study by Sheppard and Lenicki in which managers describe fair and unfair treatment including items such as "providing adequate information before actions are taken" and "assigning challenging and meaningful work fairly" (Greenberg 1990, p. 405). This description sounds like another parameter of justice defined by Moorman and Niehoff as interactional justice (Moorman, 1991). The concept of interactional justice encompasses how workers are treated by management, employee involvement in decision-making, voice, respect, and fairness.

Concepts from the literature are used in this study

The Demand-Control Model is empirically applicable to study the effects of chronic strain in the DOE workforce. Changes in the DOE mission and the reduction of the workforce bring into question the effect of chronic strain in the organization. In particular: Will decreases in resources within the DOE increase worker demands? Will the prospects of involuntary layoffs undermine the control of workers? What effects will the "flattening" of the organization, as part of the downsizing strategy, have on the availability of support? Given that chronic strain results from the interplay of demand, control, and support, these are serious questions.

This study focuses on the health impacts resulting from a stressor's (downsizing) effects on an organization and its employees and the resultant individual and organizational strain. The D-C Model of organizational stress is attractive because it is clearly defined

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compared to other organizational climate models. The Job Content Questionnaire (JCQ), the measurement tool for the model, includes scales for worker control (authority over tasks plus discretion over the utilization of skills), demands (psychological and physical demands), and social support (supervisor support and coworker support). These scales are included in this study as job strain (a compilation of demand and control), supervisor support, and co-worker support.¹

Job security is one of the organizational outcomes used in this study. We use several physical and mental health measures as outcomes. We do not test the relationship between job security and health in this study.

Downsizing is the stressor that we studied. We constructed a model to examine the impact of both the magnitude of the downsizing (measured as a rate) and the approach to downsizing (four scales to measure type of layoffs, process and individual experience). The outcomes we examine are variables mentioned in previous studies including job security, survivor syndrome, morale and work performance. We incorporated other key concepts (e.g., conflict, job satisfaction, etc.) as co-variates in our model.

Our study utilized two fairness scales. One is a four-item procedural justice scale in which we chose two interactional justice and two formal procedure questions from a 12-item scale (Moorman, 1991). In the survey section focusing on downsizing at the site (survey section E), we included a 14-item scale on the downsizing process. This scale includes tested questions on justice (seven items measuring formal procedures and interactional justice) as well as questions to elicit perceptions about the fairness of the downsizing process (three items on employee involvement and communication) and the outcome of the downsizing (four items on efficacy, retraining, and frequency).

¹ Other JCQ scales or items included are: noise exposure, toxic exposure, and job security.

C. Qualitative Data: Importance and Use

The importance of qualitative data

Ethnographic data, or descriptive information, which uncover patterns of employee culture, provide an important research strategy for studying questions and populations that may be inaccessible using other research techniques. Ethnographic methods produce in-depth and detailed data through direct quotation and careful description of situations, events, people, interactions, and observed behaviors (Agar, 1980 and Spradley, 1979). Interviews with key informants, work-site observations, and focus group discussions permit the researcher to understand the world as seen by the respondent within the context of the respondent's everyday life. This information provides powerful insight about the dynamics of situations, experiences, and relationships.

The use of open-ended survey questions, interviews, and focus groups to elicit DOE workers' perceptions of downsizing, restructuring, organizational culture, health, and performance encouraged more explicit explanations than our ongoing parallel research activity of the close-ended survey. The questions tapped the variables of interest for the study: How do employees characterize the effects of downsizing? What are the employees' understandings of the impact of downsizing on the work demands, control, and social support? How do employees perceive their health and performance to be affected by workforce restructuring?

Ethnographic methods yield different types of information

- Individual interviews are helpful in detailing individual perceptions, as they provide the opportunity to go into depth in a one-on-one setting.
- Focus groups are an efficient way to gain a wide range of information. Group discussions prod individuals to remember shared experiences and to compare ideas in reaction to the statements of others. Semi-structured focus groups also permit greater attention to the themes of the study (i.e., characteristics of downsizing, organizational culture, health, and performance) and allow generic issues to surface around pivotal points.
- Open-ended survey questions provide an opportunity to capture employee-volunteered comments in response to a broad request for 1) additional information regarding concerns not addressed in the close-ended survey questions and 2) thoughts on improving their work life. We will utilize responses to the second open-ended question in crafting an intervention project.
- Direct work site observations (tours) provide researchers with a context for employee perceptions and the means by which to interpret the correspondence between stated beliefs and behavior.

How qualitative data is summarized and analyzed

Qualitative research can produce a large volume of information that must be organized thoughtfully so as to take advantage of the breadth and depth of the data. The qualitative data analysis process requires careful methodology; it has to be systematic and goal-

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oriented, reducing the qualitative information in such a way that it becomes distilled to its essentials, rather than simply diminished in volume, and leading to a result that others can accept as representing the data. This organizing scheme for extracting essentials is known as classification (Tesch, 1987). The outcome consists of the reduction or condensation of these data to a description that extracts the most important features of the phenomenon under study and explicates the patterns that are discovered. Ethnographic material has proved invaluable in improving instrumentation and scale reliabilities in other research that considered similar study variables (McNeely, 1994).

Programs for computer-assisted classification and analysis of text can be extremely useful tools for the management of qualitative data. We created custom-designed Filemaker Pro and Microsoft Access databases to assist us in housing, classifying, and analyzing qualitative data from the focus groups and open-ended survey questions. The analysis of the interviews was conducted by hand.

The use of qualitative data was particularly valuable for this study, where the intent is to understand the employee experience of downsizing and then develop an approach to downsizing resulting in dynamics that preserve the health and productivity of workers. The qualitative data, including interviews, focus groups, observations, were used in several ways:

- as a source of preliminary information on issues and dynamics at each site (interview data);
- to paint a more complete picture of each of the study sites (focus group data);
- to identify key constructs and themes for the quantitative survey instrument and, later, to refine questions;
- to prioritize the items for the survey and the statistical model; and
- to understand relationships uncovered in the survey and archival data.

The integration of the qualitative and quantitative data was particularly important, as it provided insights for answering our research questions.

D. Data Collection: Methods and Evaluation

Site selection

The initial step in the study was to select Department of Energy sites to include in the study. A letter of introduction was sent to regional DOE offices describing the study. During this time, DOE was designing a generic research protocol for notifying sites about research projects, which included getting approval from each site's human subjects review board. Applications were made to the human subjects review board of NIOSH, Boston University, and sites that had a functioning board.

An initial list of sites subject to 3161 downsizing was compiled. We wanted to include sites that differed on key variables including:

1. site mission
2. facility type (laboratory, production, clean-up site)
3. site size and location.
4. rate of union membership
5. downsizing rate and experience
 - rate of exposure
 - number and content of support programs for surviving and displaced employees
 - level of worker participation in the process

Important organizational considerations included a willingness to allow salaried and non-salaried employees to participate, availability of data, and management representatives open to an extensive research protocol including surveys and focus groups. We were only interested in sites that had or were expecting to experience downsizing.²

We attempted to collect demographic, work organization, and downsizing data from DOE headquarters and the site. Some data were either unavailable or not available for the population of interest. Phone interviews were conducted with stakeholders at the potential study sites. The purpose of these inquiries was to determine the feasibility of conducting the study at each location and to narrow the sample selection based on that information. We also completed a profile of the union activity/membership at each and made contact with all major bargaining units prior to site visits.

Funding for this study began September 30, 1995. At the end of June 1996 we delimited our sample to five sites: Pantex, Idaho, Nevada, LANL, and Rocky Flats. Subsequently, Rocky Flats was dropped from the study sample (issues of access and site cooperation) and the Y-12 Plant on the Oak Ridge Reservation was re-added, offering an example of a site with significant downsizing and other organizational changes (split contracts, new contractors, and outsourcing).

² The Pantex Plant in Amarillo, Texas was initially selected as a control site. Our first visit to Pantex was in November 1996. At that time, it was clear that they were going to have a downsizing event (which subsequently was carried out in early 1997).

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Instrument development

We developed focus group guidelines as well as questions for site record review and preliminary phone interviews. We wrote an interview instrument with targeted questions for informants from different organizational areas (budget, safety, medical, employee assistance, etc.). The interview instrument was refined prior to each site visit to incorporate feedback and to include site-specific issues.

Site visits

The initial research efforts were site visits to collect the preliminary qualitative data. Generally, two to three research personnel attended each site visit and were often accompanied by personnel from NIOSH and/or DOE headquarters.

The goals of the visit were: 1) to develop on-site relationships; 2) to appreciate first hand the conditions in the environment that people connect with stress; 3) to collect via individual and group interviews current accounts of stress and downsizing; and, 4) to identify ways of measuring health and performance effects in the historical record.

In order to meet these goals, we undertook the following over the course of one five-day or two three-day visits:

6. interviews with top and middle management for the prime contractor and major subcontractors, particularly in divisions or departments of primary interest to this project (safety and health; occupational medicine; security; outplacement; public relations; and human resources, including benefits, compensation, staffing and diversity, among others);
7. meetings with data collectors and managers in the divisions of interest;
8. interviews with key DOE field or operations office personnel who work with the contractor on safety and health or personnel issues;
9. interviews with representatives of major unions and community groups;
10. focus groups of employees, divided by job category and representative of the job breakdown at the site (not at the Nevada Test Site); and
11. a community meeting to allow family members, former workers, and other community members the opportunity to contribute to the study.

Interviews

Interviews were used to gather information about:

- the structure of the site;
- processes and policies related to downsizing, personnel or other issues;
- data availability; and
- individual perceptions of downsizing.

Some of the interviews were with individuals responsible for managing the data that was important for our study. We collected sample records to determine the format and availability of records from 1991 through June 1998. We also collected policy statements and reports related to study issues.

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Community meetings

Community meetings allowed us to disseminate information about the study more widely and to collect perceptions, ideas and critiques from family members, former employees and the general community. We sponsored community meetings in four of the study communities (Oak Ridge, Tennessee; Los Alamos, New Mexico; Amarillo, Texas; and Idaho Falls, Idaho), each attended by 15-30 people. No meeting was organized in Las Vegas but a meeting was scheduled with some former workers.

Focus groups

As described in the body of this report, focus group research was a key data element in this study. We conducted focus groups at four of our five sites: INEEL, Pantex, Y-12, and LANL. We did not conduct focus groups at NTS as the initial (and only) site-visit for qualitative data collection was in March 1998, just prior to administering the completed employee survey. In place of a focus group, the site visit team held a discussion group with representatives of the Southern Nevada Building Construction and Trades Council (SNBCTC).

Worker communication and notification

Discussed in the body of the report.

Evaluation of initial research and data collection

There were extensive process evaluation measures throughout this research protocol. All steps were clearly documented, the rationale for decisions and changes to the protocol was recorded, and participation levels at each stage were summarized. The project managed the funds allocated to this study in an efficient manner. We used a participatory evaluation methodology. Formal and informal feedback from site contacts, study partners, and study participants was always solicited and was of critical importance. Our protocols and instruments were designed collaboratively with input from people at each site during the design process so that the research would be relevant to the concerns and interests of the affected population.

Site contacts (contractor management, local DOE management, and union leadership) made suggestions about how best to approach their employees, language and methods that would be more or less successful at their site, and constructs pertinent to their work experiences. Site Institutional Review Boards, medical directors, and others in upper management reviewed the employee survey and plans for administration. Our research partners and funders--NIOSH and the DOE--offered input throughout the process and the human studies review boards of both entities reviewed the study protocol annually.

The greatest challenges during this phase of the research were to meet deadlines and establish site participation and access agreements. While DOE expects contractors to participate in DOE-related health studies, some contractors were unclear as to how to fit

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these requirements into their contracted work.³ Timelines were continually pressed because of the number of contacts needed to finalize plans and competing work demands on our points of contact. Conducting a study in a high-security environment is challenging, particularly, when study personnel do not have government security clearance.

Our status as outsiders in this system had contradictory effects. On the one hand, it made some contacts wary of sharing data while on the other it encouraged greater honesty from some as we were perceived as neutral. Other structural hurdles at some sites were getting access to human resources personnel given that our central contacts were environmental safety and health professionals, and educating our contacts about this non-traditional exposure study.

Overall, this research yielded the information needed to develop and edit the employee survey and to proceed with further archival data collection and the data analysis. Some specific challenges and actions taken during this phase of the project are highlighted below.

- Some contractors were not receptive to the study and the incumbent commitment of resources.

We dropped one study site after almost a year of attempting to secure cooperation and replaced it with Oak Ridge. Oak Ridge/Y-12 Plant under the leadership of LMES was perhaps the easiest site at which to arrange access and participation, because contractor management were receptive and contractor and local DOE study contacts were exceptionally helpful.

- No obstacles were encountered in conducting interviews or focus groups.
At the five sites, attendance at focus groups of invited employees ranged from 20% to 50%. We attributed this mainly to unexpected changes such as shift in work schedule, conflicting work requirement, or sick time. While we recognize that self-selection for participation influences the outcome, participants had a wide variety of work experiences and opinions about the downsizing process and researchers used summaries of the groups to identify themes rather than relying on each voice as objective finding.

³ We began this study while a new DOE protocol for human studies was being developed; copies were then distributed to sites but the information did not filter down to all study contacts.

Appendix E

E. The Boston University Workplace Survey

Sections and scales, summarized

1. Job information

management level	job category	site and job tenure
shift	pay/union status	hours worked
work with other groups		second job

2. Job characteristics

job demand	role ambiguity	feedback quality
job security	violence at work	toxic & noise exposure
job control (skill discretion, decision authority)		

3. Organizational factors and climate

supervisor and co-worker support		morale
innovation	mission	organizational commitment
justice	conflict resolution	communication
DOE relations	safety	

4. Individual experiences (of the workplace)

work performance	matrixing structure	workload dissatisfaction
job satisfaction	perceived stress	stress index

5. Organizational change

goals of the downsizing	opportunity
skill loss	survivor syndrome
downsizing experience	downsizing process/fairness

6. Health information

medical conditions	medical symptoms
general health inventory (SF-12, physical and mental health components)	
health behaviors (drinking, tobacco use)	

7. Demographics

gender, race/ethnicity, age group, marital status	
spouse's work life	# of children
income	health insurance status

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F. Survey Sampling and Administration Protocols for the *Boston University Workplace Survey*

Survey Sampling

1. Sample size

The survey was conducted at five sites, sampling employees from six prime contractors and two subcontractors at the five sites.⁴ We initially set the sample size at 10,000.⁵ Based on the total population at the five sites we set the sampling fraction at 42%. The number of employees sampled at each site, by contractor, is listed below.

Site	Contractor	Sample size/(%)	total # of employees
Pantex	Mason & Hanger	1,180 (44.5%)	2,861
	Subsample: BSI	94	
LANL			
	University of CA. Regents	2,793 (42.7%)	6,535
	PTLA	206 (47.9%)	430
	JCNNM	529 (44.0%)	1,203
INEEL	LMITCo	2,368 (42.3%)	5,596
NTS			
	Bechtel Nevada	921 (45.1%)	2,092
	Wackenhut	113 (55.1%)	205
Oak Ridge	LMES	2,442 (42.6%)	5,733
TOTAL	5 sites/ 8 contractors	10, 646 (43.2%)	24,655

2. Database for sampling and tracking/mailing

We requested that each contractor send us a database of all their current employees and include the following fields: name, address (building and/or mail stop), level 3 (name of division or department), level 2 (name or code for work group), gender, race/ethnicity, age, and phone number. Some contractors did not include demographic information and instead provided us with summary data for the site for gender, race/ethnicity, age groups,

⁴ A third subcontractor, the MK Ferguson company at Oak Ridge, was not included in the survey sample because more than 60% of their employees are seasonal and/or contractual employees. We decided to not include MK Ferguson in the survey because 1) as a construction subcontractor their organizational structure and work force were significantly different from the other eight contractors and 2) we would not be able to adequately ensure confidentiality given the small pool of permanent employees (170).

⁵ Subsequently, we altered the parameters of employees to be included at the Oak Ridge site, increasing the pool from employees affiliated just with Y-12 operations to all Lockheed Martin Energy Systems employees. This increased the pool of people to be sampled from ~3,500 to 5,733 with a sample of approximately 1,000 more employees than initially anticipated.

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and percent of work force that is unionized. Most files were dbf or Excel files. After we drew a sample, the sampled names were entered into the Access Database used to send mailings and monitor returns.

3. Sampling process

a) Deciding on functional units for analysis

We analyzed data using a hierarchical linear model, in order to look at findings on multiple levels including individual, organizational, and contractor/site. At each site, we determined a suitable organizational level for sampling, referred to as level 3. We looked for a level wherein most of the units would have at least 20 employees.

Level 1 is the individual, level 2 is similar to a workgroup (reporting to only one supervisor), and level 3 is usually comprised of several workgroups or sections (called division, department, directorate). Given that each contractor uses different organizational language, we employ the term level 3 for the sampling unit. The survey questions are generally geared at level 1 (individual) or level 2 (group) with some referring to the whole site.

b) Exemptees

Prior to sampling, names of employees to be exempted were removed. Employees not eligible to take the survey included:

- those who had taken a pilot test of the survey during one of our visits to the site;
- points of contact and those who had signed the cover letter and/or reviewed the survey for approval (IRB contacts, general managers, union leaders, etc.); and
- at Pantex, those who had previously participated by taking the BSI survey were removed from the general pool as we planned to mail surveys to them separately under a different protocol.

c) Merging level 3s

Prior to sampling, level 3s with fewer than 20 employees were merged to create a larger unit wherein we could better protect confidentiality. Merges were based on one or both of the following parameters:

12. Selected level 3s report to the same higher group or manager.

13. Selected level 3s have similar functions.

The first step was to merge level 3s with fewer than 20 employees. When that was not possible, or to accomplish the parameters listed above, we merged a small level 3 into a level 3 with more than 20 people.

d) Sample

We sampled approximately 42% of employees with each of the eight contractors (exact fractions are listed above). The number to be sampled from a given contractor was determined and the sample was then drawn by level 3 according to the following rules:

- if level 3=20, take all employees
- if level 3>20, take a fraction of employees (or 20 if fraction <20) (fraction was determined based on the number of employees at the site, the number to be sampled, and the number and size of level 3s)
- for level 3s that have <20 employees
 - group smaller level 3s (see above)
 - sample the appropriate number based on rule 2 (fraction of merged group)

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4. Organizational codes and survey labeling

The organizational code is the code to identify the sampling unit and it is labeled on the outside of the survey and then becomes part of the unique identifier. The organizational code is comprised of up to six characters. To maintain confidentiality, we assigned a letter to each level 3. The code includes the site-specific level 3 organizational name (i.e. Department, Division, Section, Directorate) followed by an alphabetical character (A-YY), unique for each level 3. For example, human resources division would be labeled Division A (or DIVA). Level 3s that were merged were labeled with the same code. In addition, the organizational code identifies the level 2 only if more than 13 people were sampled in a given level 2; in this case a number is appended to the level 3 label (e.g. Division A01), otherwise the spaces are held by "ZZ" (e.g., DIVCZZ).

When surveys were returned, an individual identifier was assigned and entered into the survey database with all other data. When a postcard was returned, the mailing database was updated. There is no way to connect the mailing database and the survey database. The full organizational identification code identifies the organizational unit but not a person. It consists of 12 characters:

- 1 first initial of site (P, L, I, N, or O) and
- 2 first initial of contractor (M, U, J, P, L, B, W, or L)
- 3-8 org code (letters and numbers) from one to six characters as described above
 - If ORGCODE < 6 characters, "Z" will be used at end to hold remaining places
 - if an individual removes the org code from their survey, it is coded "ZZZZZZ"
 - the letter (and number) is preceded by (DIR, DEP, SEC or DIV)
- 9-12: individual identifier 0001-9199 with numbers assigned by site.

PANTEX	0001-0999
And BSI	9001-9199
LANL	1000-3999
INEEL	4000-5999
NTS	6000-6999
Y-12/OR	7000-8999

e.g. code: **NBDEPAZZ6253**
Nevada Test Site (N), Bechtel Nevada (B)
org code/level 3: Department A (DEPA) survey# : 6253

5. The Nevada Test Site Sample

Bechtel Nevada Sample

There are 25 departments (level 3s) and 2,092 employees.

There are 15 sampling units (13 level 3's with < 20 employees).

We created 3 sampling units from the 13 based on similar functions (mostly executive/director level) and that they report to the same manager.

Sample size = 921 Returns= 627

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Wackenhut Security, Incorporated (WSI) Sample

There are 11 sections (level 3s).

There are 4 sampling units (9 levels 3's with < 20 employees)

We created 2 merged sampling units based on similarity of reporting and level of function.

Sample size = 113

Returns= 72

Survey administration

The Boston University Workplace Survey was administered to contractor employees at our five DOE study sites, and subcontractor employees at Los Alamos National Laboratory (Johnson Controls Northern New Mexico (JCNNM) and Protection Technology of Los Alamos (PTLA)) and the Nevada Test Site (Wackenhut Security Inc. (WSI)).

Administration began July 1, 1998 and was completed in November 1998.

We presented management with three options for administering the survey (March 1998.) Balancing issues of cost, confidentiality, and response rates, management from all sites decided upon a survey that would be mailed to employees at work for completion during work time.

Survey packets were boxed and shipped to a designated site contact and distributed to employees via internal mail. The survey packet consisted of the following:

- Cover letter --signed by contractor and subcontractor managers, DOE Operations Office manager, site medical director, and union leaders
- Informed consent form
- *Boston University Workplace Survey*
- Tracking postcard (business reply mail)
- Return envelope (business reply mail)

Participants were instructed to mail the survey in the envelope provided and to send the tracking postcard separately. An employee's name and study ID# were printed on the tracking postcard as the sole means to determine whether to send reminders.

All tracking postcards were logged into the tracking database within one day of being received. Reasons for not completing the survey (communicated on the tracking postcard, in letters or on returned surveys) were also recorded in the database.

Reminders sent to increase response rates

A series of three follow-up mailings were used to increase response rates. The mailings were staged 10 days, four weeks and seven weeks from the initial mailing. The content of each follow-up mailing is described below:

Mailing 2: Reminder/Thank you postcard

Mailing 3: Same contents as original mailing with new cover letter

Mailing 4: Reminder Letter

Mailings #3 and #4 were only sent to individuals who had not returned their tracking card indicating a returned survey. Because the tracking card was our primary method to indicate a returned survey, anyone who 1) returned a survey without also sending the

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tracking card, 2) included the tracking card with their survey, or 3) whose postcard was lost in the mail, also received a follow-up mailing.

Survey mailings to NTS employees

Mailing #1: August 19
Mailing #3: September 22

Mailing #2: August 27
Mailing #4: October 16

Survey publicity and promotion

In addition to the follow-up mailings, a series of employee notification methods were used to publicize the survey in and around the time of the first mailing. Increasing employees' awareness of the study and reminders were thought to boost participation. Methods used at each site varied slightly based on available mediums and are described in detail in the site-specific administration section. The general content of the publicity protocol and rationale for each piece is listed below:

- *Press Release in site newsletter, one month prior to first mailing*
Purpose: To provide an update on the status of the project and to inform employees of the up-coming employee survey.
- *Updates to union leaders about survey*
Purpose: To keep union leaders apprised of the survey status and ask that they encourage their members to participate.
- *Press Release in site newsletter, one to two weeks prior to mailing #1*
Purpose: To announce the survey mailing and staff site visit
- *All employee e-mail, one day prior to employees receiving mailing #1*
Purpose: To notify employees that surveys should be in their mail boxes and provide location and times of project staff's site visit.
- *Local press news release, day of site visit*
Purpose: To inform the general community about the study and to emphasize the importance of employee participation in the survey.
- *Site Visit, two to five days after employees received the first mailing*
Purpose: To be available to address employee questions and concerns, and collect completed surveys.
- *Bulletin board announcements posted, one week after mailing #1.*
Purpose: To provide a visual reminder to employees to fill out and return the survey

Publicity Methods at NTS

- Site Lines press release #1, July edition
- Site Lines press release #2, August edition
- All Employee email, Bechtel Nevada August 19
- Administrative employee email, Wackenhut Services Inc, August 19
- Protective Services briefing, WSI August 19-26
- Site Visit: August 25, 26 (Les Boden)

G. Archival Data Collection, Rate Calculation and Evaluation

Purpose and process for collecting archival data

During the first few site visits to Pantex and INEEL, we reviewed extensive records to determine those “objective” organizational data that would be useful for the study. We were interested in archival records that were relatively complete in paper or electronic form for the study period (1991-1998), that were considered to be well kept by the record keepers, and that might shed light on health and safety changes related to organizational change. The records we reviewed⁶ had numerous limitations.

Based on the model for analysis and contractor responses to data availability requests (sent spring 1998), we established guidelines for selecting data sets to pursue:

- summary data must be available from (or attributable to) the level 3 work unit (and ideally at level 2) utilized in the survey sampling protocol;
- data sets must be available at all five sites;
- monthly or quarterly data must be available (preferably monthly);
- data should be available for the entire study period (January 1991-June 1998) or for as many years as possible.

From the original list of data sets, we eventually pursued these five areas from the contractors:

1. sick time/paid time off data;⁷
2. overtime usage;
3. downsizing data;
4. accident and illness data; and
5. Employee Assistance Programs information and data

The specific data elements, reason for inclusion, and intended use of each data type are described below. Based on results of the initial research into this organizational outcome data, we chose not to pursue data on employee concerns (including labor relations/union grievances) or absenteeism. Regional economic indicator data was also pursued from publicly available sources.

Defining, collecting, and preparing data sets

We solicited organizational outcome and other archival data from the main contractor at each site, plus a total of three other sub- or additional prime contractors: Johnson Controls Northern New Mexico (JCNNM) and Protection Technology Los Alamos (PTLA) at Los Alamos National Laboratory (LANL), and Wackenhut Security (WSI) at the Nevada Test Site. Data was requested for January 1991 through June 1998. In some cases the entire

⁶ Records reviewed during initial visits were: medical records, health claims data, worker compensation claims, sick leave data, safety and regulatory affairs data, employee assistance program data, employee grievances, EEO records, outplacement data, procurement records, human resources data including employment levels and attrition, and downsizing data (reports, numbers, support program information, outplacement program data).

⁷ At two sites, sick time is part of a paid leave or paid time off policy. We collected paid time off data when no sick leave information was available. While these raw numbers measure different phenomena, we felt we would be able to utilize the data for within site analyses although not for comparison with other sites.

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period was not available as contractors had changed or data storage systems were not comparable throughout the study period.

Four data sets (sick time, overtime, accidents, and downsizing rates) were collected by level 3 and the data was stored in a separate database for each contractor by month (or quarter) and year for each level 3. The mechanism for tracing data and assigning it to a present day level 3 is described in the body of the report. Employee Assistance Program (EAP) and economic indicator data are site-wide.

Below is a brief summary of each data element and how rates were calculated from the raw data. For all data sets, we obtained information on policies, policy changes, and organizational restructuring changes for use with data mapping and interpretation.

Overtime and sick time data

These data sets were identified as possible outcome variables describing the health and productivity of the organization. In addition to a summary of the number of sick time (paid leave) and overtime hours used monthly, by level 3, we requested monthly employment figures at the same level (to enable us to derive rates). We also collected information on overtime and sick time policies and changes in organizational structure. The structural and policy information was necessary for data mapping and interpretation.

Sick time rates are included as an outcome in the five-site, level 3 analysis. The average per capita sick time rate is for a one-year period from July 1997 through June 1998. Overtime rates were not used as an organizational outcome as the data is only available for nonexempt employees.

Sick time (ST) or paid time off	Sick time or paid leave rate (per person), for the year $\text{ST Rate} = (\# \text{ hours sick leave for 12 month period}) / (\# \text{ people in level 3})$
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Accident and illness data/CAIRS

CAIRS is a national database used to collect and analyze DOE and DOE contractor reports of injuries, illnesses, and other accidents that occur during DOE operations. The principal investigator worked with staff at the Department of Energy to access the national CAIRS database to obtain injury and accident data for the contractors in this study. We solicited monthly accident/injury data by department, all without personal identifiers. Only personal accident/injury data was processed; all property and vehicle damage records were excluded from analysis.

Each CAIRS recorded incident identifies the department involved. We used this department identifier to map the cases to the appropriate level 3. Data for the five study sites for the period 1991-1998 were sent to the project in April 1999. From the more than 30 variables collected, we chose to use only total recordable cases (TRC) in the preliminary analysis. As with sick time rates, the period of interest for this outcome variable was July 1997 through June 1998.

CAIRS	Total recordable cases (TRC) rate (per person), for the year $\text{TRC Rate} = (\# \text{ cases summed}) / (\# \text{ people in level 3})$
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Downsizing data

We began with a review of all information collected regarding exposure to downsizing. This included interviews, company policies and protocols, written reports and numbers of individuals who left contractor employment. Requests were made to the DOE Office of Worker and Community Transition (OWCT) personnel at each site for complete records on the number and types of downsizing and other restructuring during the study period (1991-1998). As the principal area of study, we chose to collect both quantitative data (i.e., number of people laid off and type of separation) and qualitative data (including downsizing process, communications to employees, employee involvement information, and services provided to separated and retained workers).

Downsizing data was culled from contractors at each site, local DOE offices, and the federal Office of Worker and Community Transition. OWCT data was available only at the site level. We relied on contractor data for downsizing numbers and types (voluntary, early retirement, involuntary) by level 3. The level 3 data was summarized and used as two of the primary exposure variables in both the individual and level 3 models. The two variables are the downsizing rate and the rate of voluntary layoffs. Both are first calculated as an annual rate for each level 3 and then the rates are averaged over the study period.

Downsizing (DS)	Downsizing rate per level 3 for the study period DS Rate = average of annual level 3 downsizing rates Where annual DS rate for each level 3 = (total # people downsized for the year)/(# people in level 3 at start of year)
Downsizing type	Rate of voluntary layoffs per level 3 for study period Voluntary Rate = average of annual level 3 voluntary rates Where annual voluntary rate for each level 3 = (total # voluntary layoffs for the year)/(# people in level 3 at start of year)

EAP data

Telephone interviews were conducted with EAP directors and/or counseling staff to acquire qualitative descriptions of the types of services offered, trends in employee complaints, office procedures, and diagnostic trends and to assess the availability of archival data on utilization. We then requested the following monthly data elements for the entire study period:

- number of employees utilizing service
- presenting problem during intake
- number of intake sessions (% of total that is spouse or dependents)
- number repeat sessions (% spouse/dependents)
- number of workshops offered

We intended to collect budget information to assess dollars spent per capita on EAP programs but none of the contractors was willing to provide this information.

Site climate data

A variable of interest is the economic health of the region in which the defense facility is located. It was hypothesized that downsizing might affect people differently if they lived in a region where securing comparable employment seemed possible. Site climate data collected included:

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- county level unemployment data
- per capita income by county and
- local housing data (average house price, changes over time)

Data was collected from the US Census Bureau and state departments of labor. This data is used only for background information but was not included in the cross-site model because there were too few observations in the model.

Evaluation of quantitative data collection process

Appropriate steps were taken to solicit input into the development of the survey instrument. We believe (and received feedback) that the survey covered the most important issues related to downsizing and health as specified in the literature and identified by site participants.

Response rates for mailed surveys can be quite low, yet it was the only administration method acceptable to site management at the five sites. We developed a system where employees used work time to complete the survey as a method of increasing participation. We also included systems to preserve anonymity of responses as well as several rounds of follow-up to non-responders to achieve our goal of a 50% response rate.

Overall, we attained a response rate of 54% with nearly 60% at three of the sites. The response rate was lowest at Oak Ridge (48%). The low rate may reflect the fact that Oak Ridge was the only site in the middle of restructuring activities at the time of the survey (both a contractor change and downsizing). The immediacy of the issues had the potential to lead to greater participation or lower participation as people are more preoccupied with their work and the changes around them. We received comments from employees as to why they or others would not complete the survey. Reasons mentioned included: feeling "over-surveyed", concerns about confidentiality despite assurances from researchers, fear of ones supervisor hearing or seeing the responses and potential repercussions, particularly during a period of downsizing.

It appears as though communication strategies to publicize the study and survey reached the intended population, although we did not conduct a formal assessment of notification methods.

There were significant challenges regarding the collection of archival data at study sites. These are sites that have and continue to undergo tremendous change. These changes have an impact on continuity of data, continuity of staff, and the amount of time our contact people have to assist us on this project. We made final determinations about which data sets to collect based on what was of greatest relevance to the study and what we could collect electronically,⁸ for some period, at all five sites.

The contractor changes at two of the five sites meant that organizational outcome data was not available in a consistent format across the study period for those sites (INEEL and NTS). At Y-12, restructuring and shifting of some employees to a new contractor had similar results: the 1998 LMES population is not easily traceable back in time as it includes employees who were previously at a central administrative branch that served several operations besides Y-12 and are now part of Y-12.

⁸ It was not feasible, given a limited budget and personnel, to review paper records.

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Specific challenges included:

- Data collection, particularly data from 1991-1995, took longer than anticipated to retrieve.
- It was difficult to trace data from defunct organizational units to the current organizational structure. Research staff worked with site experts to determine how to further aggregate or dis-aggregate data, tracing departments that had been merged, renamed or phased out.
- Some data sets that we chose to collect have complicating issues. Researchers made decisions about how to use data that were not comparable across site or study period. For example, the two sites offering "paid leave" or "paid time off" were excluded from the model that examines sick time rates as an outcome (presented in the *Five-Site Final Report*).

H. Exposure and Outcome Data Fields and Data Mapping

We obtained exposure and outcome data from the five sites for 1991-June 1998. The data sets included: sick time, overtime, CAIRs and downsizing data. A request for CAIRs data for all prime contractors operating at the five study sites during 1990-1998 was submitted to DOE Headquarters, Office of Occupational Safety and Health. The remaining three data sets were requested from each contractor's Human Resources (HR) office.

Bechtel Nevada (BN)

Paid time off data were available monthly from January 1996-June 1998. Our Human Resources site contact fit the older paid time off data to the organizational structure in June 1998. Data fields submitted include:

- Level 3 name (department), level 2 name (section), organizational code, month, year, number employees in section, paid time off hours used

Data were aggregated into the corresponding level 3s and mapped to the appropriate survey label. We were able to match 100% of the level 3s to a survey label.

Sick time data for previous contractors (REECo, EG&G and RSN) were not available through BN as all record systems changed when BN became contractor. We were only able to obtain annual sick time totals for the previous contractors (pre BN) from the Nevada DOE office. None of this data can be connected to the current organizational groups.

Overtime data company-wide were available by month from January 1997 – June 1997. Bechtel Nevada began tracking overtime by level 3 beginning in July 1997. Data from July 1997- June 1998 was obtained by level 3. Data fields submitted include:

- For January 1997-June 1997: month, year, contractor employment numbers, number of hours of overtime used.
- For July 1997 – June 1998: month, year, level 3 name, level 3 population, overtime hours

For the period from July 1997- June 1998, 86% of level 3s were matched to a survey label accounting for 92% of the reported over time hours.

CAIRS data were obtained for Bechtel Nevada for January 1996 – June 1998. With the help of our site contact at BN, we were able to map 78% of the personal accident/injury records to our survey label.

CAIRs data for REECo employees were obtained for 1991-1995. We requested CAIRs data for the remaining prime contractors who worked at the site during the same period but none were received. For the REECo records, accounting codes were listed in the department field of the CAIRS datafile and were decipherable only by using a REECo accounting code handbook. We used the accounting code handbook and discussions with a former REECo HR employee working for BN to translate REECo work units into current BN organizational framework. Records were then matched to a BN level 3 and mapped to a survey code. Using this method, we were able to map 97% of the CAIRs records for REECo from 1991-1995

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Downsizing data for three events under Bechtel Nevada were collected. Data fields submitted include:

- Level 3 name, month employees received notices, year, and whether the reduction was voluntary, involuntary or early retirement.

Data for the several downsizing events that occurred from 1991-1995 were collected from DOE Nevada. Only year-end totals could be obtained for each prime contractor broken down by the total number involuntarily or voluntarily reduced. As this data was at the contractor level, it could not be mapped to a level 3.

Wackenhut Security Incorporated (WSI)

Sick time data were collected for the entire study period (January 1991- June 1998) quarterly by level 3 (section). Data fields collected include:

- Level 3 name, quarter, year, sick time hours, level 3 population

We were able to match a survey label to 100 % of level 3s.

Overtime data were collected for the entire study period as well. Quarterly records by level 3 were received and included the following fields:

- Level 3 name, quarter, year, overtime hours, level 3 population

We were able to match 100% of level 3s to a survey code.

CAIRS data were obtained for the entire study period. 78% of CAIRS personal accident/injury records were matched to a survey label.

Downsizing data for all events between 1991-1998 were collected. The following data fields were received:

- level 3 name, month and year of event, involuntary or voluntary event, and number downsized

We were able to match 100% of level 3 data to a survey code.

Appendix I

I. Site Visits to the Nevada Test Site

Summary statistics of each visit

Visit: 1

Dates of visit: 3/9-12/98

of staff attending: 3

Research staff attending:

BU: Dr. Lew Pepper, Co-Principal Investigator; Miriam Messinger, Project Manager; Molly Jacobs, Research Assistant

NIOSH: Soo-Yee Lim

Number of participants this visit:

Interviews: 25

Meetings:

Opening Meeting 11 attendees

Southern Nevada Building & Construction Trades Council 11 attendees

1 focus group 9 employees (0 females)

4 pilot testing groups 32 employees (14 females)

Visit: 2 **Survey Administration**

Dates of visit: 8/25-26/98

Summary: One staff person, Les Boden, was available to answer employee questions about the survey and to collect completed surveys.

J. Overview of Employee Assistance Program Data

EAP data requested

Organizations use Employee Assistance Programs (EAPs) to help assist employees in resolving their personal problems with the intention of improving organizational productivity. Of primary interest to our study was the role EAPs play in mitigating the psychological impacts that workplace changes have on employees. We collected both qualitative and quantitative data at the five study sites to characterize the content of these programs and describe how often they are used. Telephone interviews were conducted with EAP directors and/or counseling staff to acquire descriptions of the following:

- types of services offered
- referral patterns to the EAP
- standard office procedures
- outreach programs
- staffing levels
- diagnostic trends observed during times of downsizing

Formal requests to obtain utilization statistics were sent to the EAP Director. We requested the following monthly data elements for the entire study period along with fiscal EAP budgetary statistics:

- number of employees utilizing service
- presenting problem during intake
- number of intake sessions (% spouse/dependents)
- number of repeat sessions (% spouse/dependents)
- number of workshops

Budgetary information which provided a means to assess a site's commitment in providing EAP services was not obtained from any of our sites. Only one site offered a reason for not sending this information: "It's none of your business."

EAP Services at the Nevada Test Site

We interviewed EAP personnel at Y-12 and reviewed EAP utilization data. Trends, observations and recommendations based on the analysis follow.

NTS uses an on-site EAP within the Occupational Medicine Department (before Spring 1999 EAP was organized within the Human Resources Department) and is available to all employees working at the test site. The same EAP serviced the site when multiple contractors managed NTS before 1996. The EAP currently operates with one counselor and one part-time support staff and averages 140 contacts per month at the time of our interview. Employees primarily come to use the program through self-referral; prompted by seeing a flier, pamphlet, word of mouth or through suggestion of supervisors.

The EAP coordinator characterized a natural history of employee complaints and concerns around the downsizing. Two chief complaints that were consistent throughout all years of downsizing and during the consolidation under Bechtel Nevada were emotional problems

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and family problems. The EAP saw a few cases of stress that they attribute at least partially to potential job loss. Employees came to the program with physical complaints that couldn't be explained by their physicians. Most often complaints were attributable to depression.

Family problems emerged as a focus during this time period. For the most part, these were preexisting problems that had not been recognized or handled when the work environment was more stable. The EAP staff hypothesize that these home issues came to the forefront when there was no longer a safe-haven for the employee at work. When their work life was dissolving, individuals needed to rely on their family but realized that the family situation was not stable. Employees sought out the EAP to aid in their family crises because that was the element they felt had hope for change. Stress from work and reduced patience led to concerns about parenting.

No utilization data was collected from NTS. The EAP director explained that their database was inaccessible because of information system changes. Due to Y2K compliance, restoring EAP's database was not a priority project for the information technology department and was not likely to happen within our needed timeframe.

Appendix K

K. Description of Survey Scales and Alpha Coefficients

Measure	Description
Psychological Job Demand	A 9-item Karasek scale () measures the psychological demands of one's work (part of Job Strain Model). (1, Strongly Disagree - 4, Strongly Agree).
Role Ambiguity	A 4-item Caplan scale () examines how clearly job expectations and responsibilities are understood (1, Never - 4 Always).
Feedback Quality	A 3-item NIOSH scale (= 0.87) asks about the quality and timing of information necessary to do one's job well (1, Never - 4, Always).
Job Security	A 6-item scale (= 0.72) with items from Karasek's job insecurity scale and newly constructed items. Measures how secure one feels in his or her current job as well as perceptions regarding new job opportunities (1, Not at All True - 4, Very True).
Toxic Exposure	3 Karasek items (= 0.76), measures one's perceived threat from environmental work conditions including chemicals, air pollution and disease pathogens (1, Not Exposed - 3, I am Exposed, and it is a sizable or great problem).
Noise	1 Karasek item that measures one's perceptions of exposure to noise at work (1, Whisper - 4, Shout).
Skill Discretion	This 6-item Karasek scale (= 0.77) captures the spectrum of skills used in one's job. First of two "Decision Latitude" or control scales that form the Job Strain Model. (1, Strongly Disagree - 4, Strongly Agree).
Decision Authority	A 3-item Karasek scale (= 0.79) measures decision-making authority in one's job. Second of two "Decision Latitude" or control scales that form the Job Strain Model. (1, Strongly Disagree - 4, Strongly Agree).
Macro Decision Authority	2 Karasek items (= 0.43) that measure one's influence over work group decisions and whether decisions are made democratically (1, Strongly Disagree - 4, Strongly Agree - 9, I work alone).
Workplace Violence	An index of 3 items taken from a scale developed by Mangione measures hostility in the workplace (1, Yes - 2 No). Reverse scored.
Supervisor Social Support	A 5-item Karasek scale (= 0.88) asks respondents whether their supervisor provides personal support and facilitates productivity (1, Strongly Disagree - 4, Strongly Agree).
Co-worker Social Support	A 6-item Karasek scale (= 0.84) measures the degree to which co-workers are perceived as competent, cooperative, understanding and supportive (1, Strongly Disagree - 4, Strongly Agree).

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Measure	Description
Morale	A 2-item Lim scale (= 0.88) rating personal and co-worker morale at work (1, Very Low - 5 Very High).
Innovation	A 5-item Industry/Corning scale (= 0.83) asks how supportive one's work environment is to new ideas and open dialogue (1, Strongly Disagree - 5 Strongly Agree).
Organizational Involvement	Part of Cook and Wall's (1980) Organizational Commitment scale (= 0.68) which measures how involved one is in the work place (1, Strongly Disagree - 5, Strongly Agree).
Organizational Identification	Part of Cook and Wall's (1980) Organizational Commitment scale (= 0.82) which measures how closely respondents identify with their employer (1, Strongly Disagree - 5, Strongly Agree).
Mission	A new BU 3-item scale (= 0.63) inquires about one's understanding and opinions regarding the site's mission, as well as if one's work contributes to the mission (1, Strongly Disagree - 5, Strongly Agree).
Procedural Justice	A 4-item scale (= 0.91) truncated from Moorman & Niehoff measures the justice in decisions and procedures used by supervisors (1, Strongly Disagree - 5, Strongly Agree).
Conflict Resolution	A 6-item Industry scale (= 0.81) asks how problems are addressed within work groups and between contractors (1, Strongly Disagree - 5, Strongly Agree).
Organizational Communication	A 3-item BU scale (= 0.86) asks how strong communication is between management levels in the organization (1, Strongly Disagree - 5, Strongly Agree).
DOE Relations	A 4-item BU scale (= 0.82) examines employee perceptions of the DOE and how well they interact with the site (1, Strongly Disagree - 5, Strongly Agree).
Safety	An 8-item Murphy/NIOSH scale (= 0.90) measures safety and health practices (1, Strongly Disagree- 5, Strongly Agree).
Perceived Stress	A 4-item truncated scale (= 0.76) from Cohen (1981) measures the degree to which situations in one's life are appraised as stressful (1, Never - 5, Very Often).
Coping/Stress Index	A 4-item Industry scale (= 0.90) quantifies work stress in addition to the degree to which work stress is managed by the organization (1, Strongly Disagree - 5, Strongly Agree).
Work Performance	A 6-item scale (= 0.53) Mangione) measuring concepts of absenteeism, poor work habits, confrontations, and injuries (1, Never - 6 or more times).

Appendix K

Measure	Description
Job Satisfaction	A 4-item Caplan scale (= 0.84) measures elements of job satisfaction including job training and decision involvement (1, Never - 4, Always).
Workload Dissatisfaction	A 3-item Caplan scale (= 0.85) measures the satisfaction with the amount, pace and type of one's workload (1, Never - 4, Always).
Matrixing	A new 8-item Mangione scale (=0.80) asks matrix employees to comment on issues such as divided loyalties, no home work group, not knowing co-workers, being a "generalist" rather than a "specialist," conflicting instructions, and supervisors being unable to thoroughly review the employee's performance (1, Not at All True – 4, Very True).
Restructuring Goals	A BU index of 8 potential goals for the latest restructuring. Respondents are asked to choose what 3 primary goals were and check whether or not those goals were achieved.
Opportunity	A 7-item Lim and Martin scale (=0.91) measures the type of opportunities that emerged in one's job after restructuring (1, Much Less Often - 5, Much More Often).
Survivor Syndrome	A 6-item Lim scale (=0.83) measures the adverse psychological effects experienced after downsizing(s) (1, Much Less Often - 5, Much More Often).
Skill Loss	2 items created by Murphy which ask respondents to recall the frequency that co-workers who left after the most recent restructuring had key knowledge and/or skills which were not replaced (1, None -4, 6 or more).
Downsizing Experiences Index	A BU index of 7 possible ways the respondent was affected by restructuring during 1991-1998 (possible scores 0-6).
Fairness or Downsizing Process Perceptions	A BU 14-item scale (=0.87) measures perceptions of the processes used during the last major restructuring (1, Strongly Disagree - 5, Strongly Agree)
Medical Conditions	An index of medical conditions and whether each condition was diagnosed by a physician and if it was bothersome in the last six months (scored as 0-8, 1 point for each condition ever experienced).
Medical Symptoms	An index of medical symptoms experienced in the last 30 days (scored as 0-10, 1 point for each condition ever experienced, with symptoms grouped into five physical systems).
Short Form Health Survey (SF-12)	A 12-item version of the Short Form Health Survey (1996) comprised of two component scales: physical health (PCS) (=0.57) and mental health (MCS) (=0.69).

Appendix K

Measure	Description
Medical Assistance	2 items that inquire whether or not employees feel reluctant to seek medical or psychological support (1, Strongly Disagree-5, Strongly Agree).
Drinking	2 items which inquire the number of days per week the person drinks and the number of drinks consumed per day.
Alcoholism	4 items which are symptomatic of alcohol abuse, scored as an index (possible score 0-4, 1 point for each yes answer).
Smoking	An index of the type of tobacco product used, when use started, the average number used per day and the age when quit habit.

Appendix L

L. Variables Collected: Description, Scale Scores and Use in Models

Independent Survey Variables Included in HLM and Level 3 Models (ST and TRC)

Variable Name	Survey #	Scoring Equation and Interpretation
Downsizing Experiences Index	E5	Index of # of ways directly affected by the downsizing from 0-6. Scored as percentage: [(# impacts 0-6)/6] x 100 High score is worse = more experiences
Fairness or Downsizing Process Perceptions	E6	Reverse score items "1" and "n" then sum all fourteen items. High score is better = a more fair process

Co-variate (control and mediating) Variables Included in the Hierarchical Linear Model (HLM) and (when indicated) the Level 3 Models

Variable Name ("+" indicates in Level 3 model for sick time outcome; "~" indicates in Level 3 model for TRC outcome)	Survey #	Scoring Equation and Interpretation
Job category	A2	10 DOE categories summarized in 6 groups.
Years at site	A3	Continuous, High score = longer tenure
Pay Status + ~	A7	4 categories summarized into dichotomous term: 0= non bargaining unit; 1= bargaining unit employee. Interpret findings for bargaining unit members.
Psychological Job Demand + ~ (part of job strain)	B1	$B1a + B1b - B1c - B1d - B1f + B1g + B1e + B1h + B1i$ High score is worse = more demand
Toxic Exposure ~	B4	$B4a + B4b$ High score is worse = exposed & concerned
Noise	B5	High score is worse = noisier
Skill Discretion + ~ (part of control element of job strain)	B6	$[B6g + B6i + B6a + B6e + B6f + (5 - B6h)] \times 2$ High score is better = more skill discretion
Decision Authority + ~ (part of control element of job strain)	B6	$[B6b + B6c + (5 - B6d)] \times 4$ High score is better = more decision-making
Workplace Violence and Harassment	B7	Sum "yes" responses High score is worse = more experiences of Violence or harassment.
Supervisor Social Support + ~	C1	$C1a + C1b + C1c + C1d + C1e$ High score is better = more support
Co-worker Social Support + ~	C2	$C2a + C2b + C2c + C2d + C2e + C2f$ High score is better = more support
Conflict Resolution	C8	$C8a + C8b + C8c$ High score is better = better at resolving Workplace conflicts
Organizational Communication	C9	$C9a + C9b + C9c$ High score is better = better communication

Appendix L

Co-variates in HLM Model and Level 3 Models (continued)

Variable Name	Survey #	Scoring Equation and Interpretation
DOE Relations	C10	C10a + C10b + C10c + C10d High score is better = better relations
Safety & Health	C11	C11a + C11b + C11c + C11d + C11e + C11f + C11g + C11h High score is better = safer and healthier
Matrixing	D6	D6b + D6c + D6d + D6e + D6f + D6g + D6h + D6I High score is worse = more challenging experience as a matrixed employee
Drinking +	F11-F12	Multiply (F11) * (F12) to get Number of drinks per week High score presumed worse = more drinks
Alcoholism	F13	Create a cage/index. No = 0 and Yes = 1, range 0-4 (0 = Not affected) High score is worse = more symptoms
Smoking +	F14	Dichotomous: never vs. current and former smokers
Gender	G1	1= female 2= male Interpret findings for females
Race/ethnicity	G2	6 categories; in model scored as 1=Caucasian, 2=person of color Interpret findings for non-whites
Education level	G3	7 categorical responses; summarized as continuous # of years of education High score = more years of education
Age	G4	Categorical High score = older
Marital Status	G5	5 categories summarized in dichotomous form: 1=never/prior marriage, 2= married Interpret findings for married respondents
Children	G6	Summarized in dichotomous form: children at home yes or no Interpret findings for people With children at home

Appendix L

Outcome Variables included in HLM

Variable Name	Survey #	Scoring Equation and Interpretation
Job Security	B3	B3.i – B3.a + B3.b + B3.d + B3.g + B3.h High score is worse = more insecure About job future
Morale	C3	C3.a + C3.b High score is better = better employee morale
Perceived Stress	D1	D1.b and D1.c reversed score then... D1.a + D1.b + D1.c + D1.d High score is worse = more stress
Work Performance	D3	D3.a + D3.b + D3.c + D3.d + D3.e + D3.f High score is worse = more instances of Poor work performance
Survivor Syndrome	E3	Sum all 6 items (all in same direction) High score is worse = more symptoms
Medical Conditions	F1	No = 0, Yes = 1 (range 0-8) High score is worse = more conditions Reported (self- or doctor- diagnosed)
Medical Symptoms	F2	Sum within each body system: No = 0, Yes = 1 High score is worse = more symptoms reported
SF-12 (MCS and PCS)	F3-F9	Score according to SF-12 manual High score is better = better physical or mental health

Archival Data (see Appendix H for rate calculation)

Variable Name	Source	Variable type	Model or reason for exclusion
Downsizing Rate	Contractor	Independent	HLM and Level 3 model High score presumed worse = more Downsizing in the level 3
Voluntary Rate	Contractor	Independent	HLM and Level 3 model High score presumed better = more Of the downsizing in the level 3 is voluntary
Overtime Rate	Contractor	(considered as outcome)	Excluded because data not collected for exempt employees High score = more overtime hours Taken per capita in the level 3
Sick time Rate	Contractor	Outcome	Level 3 model (No sick time data Available for NTS or INEEL —combined within paid leave) High score = more sick time hours Taken per capita in the level 3
Total Recordable Cases Rate (TRC)	DOE	Outcome	Level 3 model High score = more accidents (cases) Per capita in the level 3

Appendix L

Variables Excluded from Analysis in HLM and/or Level 3 model

Variable Name	Survey #	Reason Not Used*	Scoring Equation
Management level	A1	4	3 categories
Tenure in current job	A4	1	Similar to tenure at site
Shift, time in shift, overtime hours, days with other groups	A5, 6, 8, 9 and 11	5 (low variability)	A5 categorical A6, 8, 9, 11 continuous
Role Ambiguity	B2	1 (morale .4)	$B2a + B2b + B2c + B2d$
Feedback Quality	B2	4 and 1(borderline w/ fairness)	$B2e + B2f + B2g$
Macro Decision Authority	B6	5 (alpha=.43)	$B6j + B6k$
Innovation	C4	1 (with many)	$C4a + C4b + C4c + C4d + C4e$
Organizational Involvement	C5	6	(reverse score C5a) + C5b + C5c
Organizational Identification	C5	1 (morale .58)	(reverse score C5f) (C5d + C5e + C5f)
Mission	C6	2	If “yes,” then... $C6b + C6c - C6d$
Procedural Justice	C7	1 (.44 fairness)	$C7a + C7b + C7c + C7d$
Coping/Stress Index	D2	1 (perceived stress -.54)	$D2a + D2b + D2c +$ (reverse score D2e)
Job Satisfaction	D4	6	$D4a + D4b + D4c + D4d$
Workload Dissatisfaction	D5	1 (job satisfaction)	$D5a + D5b + D5c$
Restructuring Goals	E1	2	1) percent choosing each goal 2) of those choosing a given goal, percent saying “yes” it was achieved
Opportunity	E2	6	$E2a + E2b + E2c + E2d + E2f + E2g$
Skill Loss	E4	4	Kept as separate items
Medical Assistance	F10 a, b	4	Two items summed

Several single (or 2) item concepts were dropped (including A10, 13, 14, C4f, D5d, B1j, B3e, B3 c/f, D2d, C7e/f, G6, G8, G9) because of ranking of conceptual importance and/or because they were not validated scales.

*Reason not used where: 1= correlated to another variable (.4 or greater)

2= >8% missing

3= Collection not consistent across site

4= lower conceptual priority due to limited space in model

5= low variability/range of responses or low alpha

6= variable type unclear (functioned as either co-variate or outcome)

Appendix M

M. Outcome Measures Compared to National Data Sets

Results of One-Sample T-Test

Outcome Variable	Total Sample		Females		Males	
	NTS	All Sites	NTS	All Sites	NTS	All Sites
SF-12 PCS						
Sample size	665	5520	179	1651	480	3816
Mean Difference	2.85***	2.17***	4.19***	2.41***	1.66***	1.42***
Standard Deviation	5.82	7.19	6.03	8.01	5.73	6.76
SF-12 MCS						
Sample size	665	5520	179	1651	480	3816
Mean Difference	-1.56***	-2.43***	-2.29**	-2.72***	-1.68***	-2.7***
Standard Deviation	9.92	10.38	10.55	10.57	9.58	10.28
Perceived Stress						
Sample size	687	5741	186	1703	493	3969
Mean Difference	-0.20	0.18***	0.1	0.62***	0.48***	0.79***
Standard Deviation	2.90	2.86	2.84	2.87	2.94	2.85

where ** = p 0.01, *** = p 0.001

Appendix N

N. Survey Comment Analysis Categories

Category	Sub-category
Relationships/Management	employee-employee relations employee-supervisor relations employee-management relations middle-upper management relations evaluation of management evaluation of supervisor(s)
Security/Future	personal future at site personal future beyond site recent job change interest in job change site mission and site future
Union	contractor-union interactions and issues personnel issues relative to union and non-union status
DOE	DOE oversight and involvement at site DOE and contractor DOE and government funding
Physical work environment	worker comfort and accommodations infrastructure upkeep/maintenance
Workplace changes (other than downsizing)	hiring externally versus promoting from within military personnel influx contractor changes subcontracting outsourcing
Job demands	physical requirements workload work schedule
Human Resource Issues	sick leave policy health insurance benefits salary/pay issues overtime handling of personnel issues (ex: firing people)

Appendix N

Survey	<p>comments on survey instrument</p> <p>personal info about responses</p> <p>(for example, responses related to accident)</p>
Health	<p>personal health issues</p> <p>stress</p> <p>Medical Department</p>
Safety	<p>hazards</p> <p>reporting safety concerns</p> <p>and DOE</p> <p>compliance</p> <p>dynamic between safety and productivity</p>
Downsizing/restructuring	<p>communication about downsizing</p> <p>personal impact</p> <p>impact on site</p> <p>process/implementation perceptions/fairness</p> <p>history/previous experiences</p>
Organizational factors	<p>program implementation/project completion</p> <p>procedures/regulations/paperwork</p> <p>security breaches/waste/fraud/abuse (include drugs and alcohol)</p> <p>training and support</p>
Climate/Psychological work environs	<p>morale</p> <p>conflict resolution</p> <p>innovation</p> <p>employee accountability</p> <p>professional atmosphere</p> <p>feedback/rewards</p> <p>teamwork/isolation</p>

Appendix O

O. Hierarchical Linear Modeling (HLM) Results Nevada Test Site Results Presented for each of nine outcomes

Step 7: Medical Conditions

Effect (variable)	Estimate	Standard Error	DF	t	Pr > |t|
INTERCEPT	8.61021151	10.5946889	16	0.81	0.4283
Ratio Downsizing	-19.76295979	10.9137106	471	-1.81	0.0708
Downsizing Experiences Index*	0.05544469	0.02422907	471	2.29	0.0226
Fairness*	0.01373530	0.06311593	471	0.22	0.8278
Ratio Voluntary	13.00263219	10.9656617	471	1.19	0.2363
Strain*	0.18710954	0.1137727	471	1.64	0.1007
Gender	-0.16101508	1.50374426	471	-0.11	0.9148
Race	3.30962850	1.38613832	471	2.39	0.0173
Education	-0.33893819	0.31067946	471	-1.09	0.2758
Age	0.09270226	0.06500651	471	1.43	0.1545
Married	-0.46483322	1.27750452	471	-0.36	0.7161
Kids	-1.26521544	1.12139125	471	-1.13	0.2598
Smoking	0.63294169	1.09568634	471	0.58	0.5638
Drinks/week	-0.09269769	0.08811048	471	-1.05	0.2933
Alcoholism*	0.07086355	0.03456335	471	2.05	0.0409
JOB Craft/Service	-1.76359659	2.19367563	471	-0.8	0.4218
JOB Laborer/Gen Ser/	1.61098078	2.48405354	471	0.65	0.5170
JOB Mgmt	-0.57986697	1.96490591	471	-0.3	0.7680
JOB Oper/Tech	1.32100702	2.00593765	471	0.66	0.5105
JOB Prof/Admin	1.43069364	1.74961302	471	0.82	0.4139
JOB Scient/Eng	0.00000000	.	.	.	.
Site years	-1.59520936	1.41291306	471	-1.13	0.2595
Pay Status	-1.05146657	1.83359221	471	-0.57	0.5666
Matrix*	0.00845587	0.02361002	471	0.36	0.7204
Conflict*	-0.02002677	0.05082327	471	-0.39	0.6937
DOE*	-0.02041162	0.04528843	471	-0.45	0.6524
Safety*	-0.09157402	0.05837637	471	-1.57	0.1174
Violence*	0.07130814	0.02527228	471	2.82	0.0050
Supervisor Support*	0.09047823	0.04062494	471	2.23	0.0264
Co-worker Support*	0.02127170	0.05590008	471	0.38	0.7037
Toxic*	0.03718539	0.04205461	471	0.88	0.3770
Noise*	-0.02719934	0.04146819	471	-0.66	0.5122
Communication*	-0.04943153	0.03534763	471	-1.4	0.1626

*scales standardized
Significant findings in bold.

Appendix O

Step 7: SF-12 Physical Component Scale (PCS) of the Short Form Health Survey (SF-12)

Effect (variable)	Estimate	Standard Error	DF	t	Pr > |t|
INTERCEPT	73.91407353	7.62745058	17	9.69	0.0001
Ratio Downsizing	16.31816748	7.64816	468	2.13	0.0334
Downsizing Experiences Index*	-0.01101405	0.01726525	468	-0.64	0.5238
Fairness*	0.00057050	0.04483607	468	0.01	0.9899
Ratio Voluntary	-3.35904365	7.82243754	468	-0.43	0.6678
Strain*	-0.05989295	0.08109306	468	-0.74	0.4605
Gender	-0.54636623	1.07524238	468	-0.51	0.6116
Race	-1.22776887	0.99261193	468	-1.24	0.2167
Education	0.38463853	0.22350905	468	1.72	0.0859
Age	-0.02233931	0.04651822	468	-0.48	0.6313
Married	-0.11494169	0.91638298	468	-0.13	0.9002
Kids	-0.43393476	0.80247078	468	-0.54	0.5889
Smoking	-0.61878953	0.78204095	468	-0.79	0.4292
Drinks/week	0.07858883	0.0630153	468	1.25	0.2130
Alcoholism*	-0.05823578	0.02495208	468	-2.33	0.0200
JOB Craft/Service	0.01498171	1.56071616	468	0.01	0.9923
JOB Laborer/Gen Ser/	-1.38665328	1.78170038	468	-0.78	0.4368
JOB Mgmt	2.04474195	1.39698323	468	1.46	0.1440
JOB Oper/Tech	-1.68614209	1.43770757	468	-1.17	0.2415
JOB Prof/Admin	2.61518400	1.25259703	468	2.09	0.0374
JOB Scient/Eng	0.00000000	.	.	.	.
Site years	0.77114604	1.03401731	468	0.75	0.4562
Pay Status	0.40004216	1.29930807	468	0.31	0.7583
Matrix*	0.00284834	0.01702524	468	0.17	0.8672
Conflict*	0.01203904	0.03637354	468	0.33	0.7408
DOE*	0.01449227	0.03221978	468	0.45	0.6531
Safety*	0.00615592	0.04204842	468	0.15	0.8837
Violence*	-0.05184421	0.01804835	468	-2.87	0.0043
Supervisor Support*	-0.08638828	0.02911775	468	-2.97	0.0032
Co-worker Support*	0.01958020	0.04046899	468	0.48	0.6287
Toxic*	-0.01517174	0.0300592	468	-0.5	0.6140
Noise*	0.03831674	0.02946084	468	1.3	0.1940
Communication*	0.01447052	0.02533027	468	0.57	0.5681

*scales standardized

Significant findings in bold.

Appendix O

Step 7: SF-12 Physical Component Scale (PCS) of the Short Form Health Survey (SF-12)

Effect (variable)	Estimate	Standard Error	DF	t	Pr > |t|
INTERCEPT	50.62162406	11.4960969	17	4.4	0.0004
Ratio Downsizing	5.30675464	11.5273101	468	0.46	0.6455
Downsizing Experiences Index*	-0.05974296	0.02602219	468	-2.3	0.0221
Fairness*	0.18686724	0.06757695	468	2.77	0.0059
Ratio Voluntary Strain*	-29.17145051	11.7899813	468	-2.47	0.0137
Gender	-0.48517836	0.1222235	468	-3.97	0.0001
Race	-0.51373245	1.6206058	468	-0.32	0.7514
Education	0.80676215	1.49606513	468	0.54	0.5900
Age	0.04021359	0.33687294	468	0.12	0.9050
Married	0.06676598	0.07011228	468	0.95	0.3415
Kids	-0.75196244	1.38117283	468	-0.54	0.5864
Smoking	-0.28205999	1.20948432	468	-0.23	0.8157
Drinks/week	1.01800904	1.17869246	468	0.86	0.3882
Alcoholism*	-0.01473604	0.09497668	468	-0.16	0.8768
JOB Craft/Service	-0.07884506	0.03760779	468	-2.1	0.0366
JOB Laborer/Gen Ser/	3.08493564	2.35231209	468	1.31	0.1903
JOB Mgmt	1.79878528	2.6853796	468	0.67	0.5033
JOB Oper/Tech	-1.44812946	2.10553374	468	-0.69	0.4919
JOB Prof/Admin	1.62897620	2.16691348	468	0.75	0.4526
JOB Scient/Eng	0.43483320	1.88791479	468	0.23	0.8179
Site years	0.00000000	.	.	.	.
Pay Status	2.23459325	1.55847134	468	1.43	0.1523
Matrix*	2.72840240	1.9583177	468	1.39	0.1642
Conflict*	0.02395127	0.02566045	468	0.93	0.3511
DOE*	0.06549496	0.05482221	468	1.19	0.2328
Safety*	0.00429621	0.04856167	468	0.09	0.9295
Violence*	-0.02993341	0.0633754	468	-0.47	0.6369
Supervisor Support*	-0.05478924	0.02720248	468	-2.01	0.0446
Co-worker Support*	0.03478277	0.04388628	468	0.79	0.4284
Toxic*	0.05816993	0.06099488	468	0.95	0.3407
Noise*	-0.02233928	0.04530524	468	-0.49	0.6222
Communication*	0.01158540	0.04440338	468	0.26	0.7943
	0.05707469	0.0381778	468	1.49	0.1356

*scales standardized

Significant findings in bold.

Appendix O

Step 7: Survivor Syndrome

Effect (variable)	Estimate	Standard Error	DF	t	Pr > |t|
INTERCEPT	65.12876699	12.1993031	17	5.34	0.0001
Ratio Downsizing	12.39606810	13.4756019	457	0.92	0.3581
Downsizing Experiences Index*	0.00601965	0.02765591	457	0.22	0.8278
Fairness*	-0.22787287	0.07223755	457	-3.15	0.0017
Ratio Voluntary	-4.30365747	14.0591493	457	-0.31	0.7597
Strain*	0.39419846	0.13024688	457	3.03	0.0026
Gender	0.90271453	1.73615769	457	0.52	0.6034
Race	0.04790985	1.59206202	457	0.03	0.9760
Education	0.52167589	0.35885692	457	1.45	0.1467
Age	-0.05516037	0.07470975	457	-0.74	0.4607
Married	-0.30860608	1.45849785	457	-0.21	0.8325
Kids	-1.34504519	1.28598957	457	-1.05	0.2961
Smoking	1.43944612	1.26202413	457	1.14	0.2546
Drinks/week	-0.09592766	0.10050255	457	-0.95	0.3403
Alcoholism*	0.07528316	0.0393139	457	1.91	0.0561
JOB Craft/Service	2.50783918	2.58975175	457	0.97	0.3334
JOB Laborer/Gen Ser/	3.38488238	2.8991631	457	1.17	0.2436
JOB Mgmt	2.06050290	2.30087265	457	0.9	0.3710
JOB Oper/Tech	3.95791544	2.29300411	457	1.73	0.0850
JOB Prof/Admin	1.66953759	2.10125894	457	0.79	0.4273
JOB Scient/Eng	0.00000000	.	.	.	.
Site years	2.22619971	1.63285473	457	1.36	0.1734
Pay Status	-0.07644072	2.11159366	457	-0.04	0.9711
Matrix*	0.02136696	0.02725752	457	0.78	0.4335
Conflict*	-0.10121027	0.058372	457	-1.73	0.0836
DOE*	-0.02571743	0.05246144	457	-0.49	0.6242
Safety*	0.02906731	0.066967	457	0.43	0.6645
Violence*	-0.06696936	0.02904504	457	-2.31	0.0216
Supervisor Support*	-0.05375617	0.04666993	457	-1.15	0.2500
Co-worker Support*	-0.05149472	0.06410106	457	-0.8	0.4222
Toxic*	-0.02858166	0.04880175	457	-0.59	0.5584
Noise*	-0.00602202	0.0475636	457	-0.13	0.8993
Communication*	-0.06340298	0.04078258	457	-1.55	0.1207

*scales standardized

Significant findings in bold.

Appendix O

Step 7: Medical Symptoms

Effect (variable)	Estimate	Standard Error	DF	t	Pr > |t|
INTERCEPT	53.12113004	19.0480456	16	2.79	0.0131
Ratio Downsizing	-6.20022564	19.3194254	475	-0.32	0.7484
Downsizing Experiences Index*	0.09005879	0.04363213	475	2.06	0.0396
Fairness*	-0.29762641	0.11331762	475	-2.63	0.0089
Ratio Voluntary	16.81391179	19.5619258	475	0.86	0.3905
Strain*	0.37510029	0.20522987	475	1.83	0.0682
Gender	-2.84570288	2.71642626	475	-1.05	0.2954
Race	1.64709786	2.50617562	475	0.66	0.5114
Education	-0.48846817	0.56216612	475	-0.87	0.3853
Age	-0.22132793	0.11722188	475	-1.89	0.0596
Married	-0.13504508	2.30594616	475	-0.06	0.9533
Kids	0.24657968	2.01611867	475	0.12	0.9027
Smoking	0.37926737	1.97783987	475	0.19	0.848
Drinks/week	-0.08001283	0.15961076	475	-0.5	0.6164
Alcoholism*	0.18201151	0.06258311	475	2.91	0.0038
JOB Craft/Service	-3.22610287	3.96041718	475	-0.81	0.4157
JOB Laborer/Gen Ser/	-1.04888180	4.51280905	475	-0.23	0.8163
JOB Mgmt	3.83704762	3.53469814	475	1.09	0.2782
JOB Oper/Tech	-0.37243136	3.61867854	475	-0.1	0.9181
JOB Prof/Admin	-1.47227163	3.14741678	475	-0.47	0.6402
JOB Scient/Eng	0.00000000	.	.	.	.
Site years	3.77598983	2.56378728	475	1.47	0.1415
Pay Status	-6.34378289	3.30443139	475	-1.92	0.0555
Matrix*	-0.05990533	0.04243588	475	-1.41	0.1587
Conflict*	-0.01542332	0.0920939	475	-0.17	0.8671
DOE*	-0.03676111	0.08157593	475	-0.45	0.6525
Safety*	-0.14915706	0.1054807	475	-1.41	0.158
Violence*	0.10064977	0.04600216	475	2.19	0.0292
Supervisor Support*	0.23722060	0.07334036	475	3.23	0.0013
Co-worker Support*	-0.15152760	0.10090778	475	-1.5	0.1339
Toxic*	0.15753977	0.07586346	475	2.08	0.0384
Noise*	-0.09500725	0.07488067	475	-1.27	0.2051
Communication*	-0.07835675	0.0638447	475	-1.23	0.2203

*scales standardized

Significant findings in bold.

Appendix O

Step 7: Work Performance

Effect (variable)	Estimate	Standard Error	DF	t	Pr > |t|
INTERCEPT	36.10940109	8.93681118	17	4.04	0.0008
Ratio Downsizing	16.07824342	9.07645685	477	1.77	0.0771
Downsizing Experiences Index*	-0.01247859	0.02049932	477	-0.61	0.5430
Fairness*	-0.07106504	0.05323703	477	-1.33	0.1826
Ratio Voluntary	-9.04844316	9.19334335	477	-0.98	0.3255
Strain*	0.03739031	0.09643869	477	0.39	0.6984
Gender	-0.59329558	1.27340165	477	-0.47	0.6415
Race	-1.30476238	1.17829984	477	-1.11	0.2687
Education	-0.33199506	0.26398472	477	-1.26	0.2091
Age	-0.12772099	0.05513307	477	-2.32	0.0209
Married	-0.39690653	1.08430578	477	-0.37	0.7145
Kids	2.73187403	0.94424615	477	2.89	0.0040
Smoking	-1.41520076	0.92874668	477	-1.52	0.1282
Drinks/week	0.13491826	0.07503839	477	1.8	0.0728
Alcoholism*	-0.01324246	0.02942322	477	-0.45	0.6529
JOB Craft/Service	0.16683871	1.85638723	477	0.09	0.9284
JOB Laborer/Gen Ser/	-0.07225812	2.11178423	477	-0.03	0.9727
JOB Mgmt	0.36635152	1.66306158	477	0.22	0.8257
JOB Oper/Tech	2.43848491	1.69752298	477	1.44	0.1515
JOB Prof/Admin	0.69462399	1.47809633	477	0.47	0.6386
JOB Scient/Eng	0.00000000	.	.	.	.
Site years	1.32171457	1.19981129	477	1.1	0.2712
Pay Status	-1.41900084	1.54119104	477	-0.92	0.3577
Matrix*	-0.01619630	0.01995085	477	-0.81	0.4173
Conflict*	-0.09500115	0.0432166	477	-2.2	0.0284
DOE*	-0.09291523	0.03829971	477	-2.43	0.0156
Safety*	0.07679104	0.04950761	477	1.55	0.1215
Violence*	0.05241578	0.02150247	477	2.44	0.0151
Supervisor Support*	0.01166562	0.03444325	477	0.34	0.7350
Co-worker Support*	-0.06317783	0.04741963	477	-1.33	0.1834
Toxic*	0.04746466	0.03557326	477	1.33	0.1827
Noise*	-0.06664828	0.03501799	477	-1.9	0.0576
Communication*	-0.04203882	0.03002104	477	-1.4	0.1621

*scales standardized

Significant findings in bold.

Appendix O

Step 7: Perceived Stress

Effect (variable)	Estimate	Standard Error	DF	t	Pr > |t|
INTERCEPT	40.64714297	12.1562452	17	3.34	0.0038
Ratio Downsizing	13.78102515	13.1490096	474	1.05	0.2951
Downsizing Experiences Index*	0.02352731	0.02780888	474	0.85	0.3980
Fairness*	-0.13960125	0.07268958	474	-1.92	0.0554
Ratio Voluntary	9.75088456	13.7761262	474	0.71	0.4794
Strain*	0.58286945	0.13083054	474	4.46	0.0001
Gender	3.31433280	1.72671424	474	1.92	0.0555
Race	1.82966487	1.59408218	474	1.15	0.2516
Education	-0.22013270	0.35960023	474	-0.61	0.5407
Age	-0.11268461	0.07499024	474	-1.5	0.1336
Married	-0.29338330	1.46804921	474	-0.2	0.8417
Kids	1.89248624	1.28058992	474	1.48	0.1401
Smoking	-0.63879875	1.2583536	474	-0.51	0.6119
Drinks/week	0.06923205	0.10151339	474	0.68	0.4956
Alcoholism*	0.12579951	0.03987764	474	3.15	0.0017
JOB Craft/Service	-2.66995180	2.55969476	474	-1.04	0.2974
JOB Laborer/Gen Ser/	1.76807409	2.88799311	474	0.61	0.5407
JOB Mgmt	-3.20114069	2.30551532	474	-1.39	0.1656
JOB Oper/Tech	-2.08769261	2.30617977	474	-0.91	0.3658
JOB Prof/Admin	-0.86363595	2.07332997	474	-0.42	0.6772
JOB Scient/Eng	0.00000000	.	.	.	.
Site years	-0.47029278	1.63013775	474	-0.29	0.7731
Pay Status	-4.30774023	2.09192371	474	-2.06	0.0400
Matrix*	-0.01849749	0.02713847	474	-0.68	0.4958
Conflict*	-0.04421556	0.05854847	474	-0.76	0.4505
DOE*	-0.02319411	0.05203795	474	-0.45	0.6560
Safety*	-0.04461557	0.06719092	474	-0.66	0.5070
Violence*	0.06199917	0.02928289	474	2.12	0.0348
Supervisor Support*	0.02809735	0.04667243	474	0.6	0.5475
Co-worker Support*	0.02811221	0.06434299	474	0.44	0.6624
Toxic*	-0.00917969	0.04919768	474	-0.19	0.8521
Noise*	0.05704654	0.04769885	474	1.2	0.2323
Communication*	-0.04538123	0.04084782	474	-1.11	0.2671

*scales standardized

Significant findings in bold.

Appendix O

Step 7: Job Security

Effect (variable)	Estimate	Standard Error	DF	t	Pr > |t|
INTERCEPT	65.85354176	11.280494	17	5.84	0.0001
Ratio Downsizing	-3.25928985	18.1444703	452	-0.18	0.8575
Downsizing Experiences Index*	0.06592436	0.02568286	452	2.57	0.0106
Fairness*	-0.18510073	0.06770308	452	-2.73	0.0065
Ratio Voluntary	-10.12761077	21.1350458	452	-0.48	0.6320
Strain*	0.29076542	0.12036625	452	2.42	0.0161
Gender	0.62070152	1.63164967	452	0.38	0.7038
Race	-1.35655724	1.46307184	452	-0.93	0.3543
Education	-0.71097873	0.33383004	452	-2.13	0.0337
Age	0.08110473	0.06969098	452	1.16	0.2451
Married	3.15710795	1.3393351	452	2.36	0.0188
Kids	1.29735308	1.17882379	452	1.1	0.2717
Smoking	0.16073980	1.16330091	452	0.14	0.8902
Drinks/week	-0.01569571	0.09292497	452	-0.17	0.8659
Alcoholism*	-0.01631316	0.03636476	452	-0.45	0.6539
JOB Craft/Service	1.90335617	2.39201827	452	0.8	0.4266
JOB Laborer/Gen Ser/	-0.96667181	2.72953414	452	-0.35	0.7234
JOB Mgmt	-0.55781073	2.1475279	452	-0.26	0.7952
JOB Oper/Tech	-0.65702474	2.12672339	452	-0.31	0.7575
JOB Prof/Admin	-0.77342127	2.00309906	452	-0.39	0.6996
JOB Scient/Eng	0.00000000	.	.	.	.
Site years	-4.05268233	1.53515633	452	-2.64	0.0086
Pay Status	-2.52849443	1.95784706	452	-1.29	0.1972
Matrix*	-0.00027443	0.02489741	452	-0.01	0.9912
Conflict*	-0.01602666	0.05361212	452	-0.3	0.7651
DOE*	-0.03871766	0.04812278	452	-0.8	0.4215
Safety*	0.02585884	0.06214826	452	0.42	0.6775
Violence*	0.06284499	0.02745407	452	2.29	0.0225
Supervisor Support*	-0.04165706	0.04318373	452	-0.96	0.3352
Co-worker Support*	0.00549973	0.05974329	452	0.09	0.9267
Toxic*	0.05677373	0.04596504	452	1.24	0.2174
Noise*	0.06819138	0.04454777	452	1.53	0.1265
Communication*	-0.10038541	0.03812251	452	-2.63	0.0087

*scales standardized

Significant findings in bold.

Appendix O

Step 7: Morale

Effect (variable)	Estimate	Standard Error	DF	t	Pr > |t|
INTERCEPT	-17.03212259	12.3441121	17	-1.38	0.1855
Ratio Downsizing	-0.53261209	14.4294905	477	-0.04	0.9706
Downsizing Experiences Index*	-0.04115144	0.02830163	477	-1.45	0.1466
Fairness*	0.04559488	0.07360427	477	0.62	0.5359
Ratio Voluntary	-21.07376125	15.5578744	477	-1.35	0.1762
Strain*	-0.23559097	0.13339124	477	-1.77	0.0780
Gender	-1.03615633	1.76106842	477	-0.59	0.5566
Race	-1.04036072	1.62123681	477	-0.64	0.5214
Education	0.27236274	0.36580202	477	0.74	0.4569
Age	-0.05567352	0.07616881	477	-0.73	0.4652
Married	-1.14719618	1.49259147	477	-0.77	0.4425
Kids	1.81893889	1.29928704	477	1.4	0.1622
Smoking	0.12289229	1.27918768	477	0.1	0.9235
Drinks/week	0.01327695	0.10308926	477	0.13	0.8976
Alcoholism*	0.00495464	0.04049818	477	0.12	0.9027
JOB Craft/Service	-1.19126940	2.62352194	477	-0.45	0.6500
JOB Laborer/Gen Ser/	0.15387153	2.95203174	477	0.05	0.9585
JOB Mgmt	0.88069023	2.35577432	477	0.37	0.7087
JOB Oper/Tech	-2.88272877	2.34802997	477	-1.23	0.2202
JOB Prof/Admin	0.31396104	2.14217936	477	0.15	0.8835
JOB Scient/Eng	0.00000000	.	.	.	.
Site years	0.44386294	1.66182883	477	0.27	0.7895
Pay Status	2.91018488	2.13342292	477	1.36	0.1732
Matrix*	0.03391727	0.02762472	477	1.23	0.2201
Conflict*	0.17663458	0.05941605	477	2.97	0.0031
DOE*	0.00588800	0.0529552	477	0.11	0.9115
Safety*	0.18349583	0.06851954	477	2.68	0.0077
Violence*	-0.02749478	0.02985187	477	-0.92	0.3575
Supervisor Support*	0.26011350	0.0474206	477	5.49	0.0001
Co-worker Support*	0.26815930	0.06541232	477	4.1	0.0001
Toxic*	0.01843327	0.05020015	477	0.37	0.7136
Noise*	0.09332730	0.04841539	477	1.93	0.0545
Communication*	0.19706471	0.04152916	477	4.75	0.0001

*scales standardized

Significant findings in bold.

Appendix P
P. HLM 7 Step Summary for Selected Variables

Physical Health Outcomes

Bold = significant at *** 0.001 ** 0.01 * 0.05

Norm PCS (SF-12)

Variable	MODEL STEPS					
	2	3	4	5	6	7
	B	B	B	B	B	B
Downsizing ratio	4.66*			7.65	7.1	7.6*
Impact		0.02		0.02	0.02	0.02
Fairness		0.03*		0.03	0.03	0.04
Percent vol		5.84		8.2	7.33	7.8
Strain			0.06	0.07	0.07	0.08
Gender					0.84	1.08
Race					0.95	0.99
Age					0.04	0.05
Marital status					0.88	0.92
Alcoholism					0.02*	0.02*

Medical Conditions

Variable	MODEL STEPS					
	2	3	4	5	6	7
	B	B	B	B	B	B
Downsizing ratio	5.78			9.42	9.89	10.91
Impact		0.02**		0.02**	0.02	0.02*
Fairness		0.04**		0.04	0.04	0.06
Percent vol		6.13		9.66	10.04	11.0
Strain			0.09***	0.09***	0.1***	0.11***
Gender					1.14	1.5
Race					1.29*	1.39*
Age					0.06	0.07
Marital status					1.19	1.28
Alcoholism					0.03	0.03

Medical Symptoms

Variable	MODEL STEPS					
	2	3	4	5	6	7
	B	B	B	B	B	B
Downsizing ratio	11.4			19.73	18.02	19.32
Impact		0.04***		0.04**	0.04**	0.04*
Fairness		0.07***		0.08***	0.08***	0.11**
Percent vol		11.97		21.44	18.46	19.56
Strain			0.16***	0.17***	0.18***	0.21
Gender					2.13*	2.72
Race					2.4	2.51
Age					0.11	0.12
Marital status					2.23	2.3
Alcoholism					0.06*	0.06**

Appendix P

Mental Health Outcomes

Bold = significant at: *** <=.001 ** <=.01 * <=.05

Norm MCS (SF-12)		MODEL STEPS				
	2	3	4	5	6	7
Variable	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
Downsizing ratio	8.35**			12.5	10.58	11.5
Impact		0.02**		0.02*	0.02*	0.03*
Fairness		0.05***		0.05***	0.05***	0.07**
Percent vol		8.04**		13.73	10.9	11.79**
Strain			0.1***	0.10***	0.10***	0.12***
Gender					1.3	1.62
Race					1.42	1.5
Age					0.06	0.07
Marital status					1.31	1.38
Alcoholism					0.04*	0.04*

Survivor Syndrome		MODEL STEPS				
	2	3	4	5	6	7
Variable	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
Downsizing ratio	16.19			14.43	15.1	13.48
Impact		0.03		0.02	0.03	0.03
Fairness		0.05***		0.05***	0.05***	0.07**
Percent vol		13.0		16.24	16.78	14.06
Strain			0.10***	0.11***	0.11***	0.13**
Gender					1.43	1.73
Race					1.5	1.59
Age					0.07	0.07
Marital status					1.39	1.46
Alcoholism					0.04*	0.03

Perceived Stress		MODEL STEPS				
	2	3	4	5	6	7
Variable	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
Downsizing ratio	9.08**			11.88	11.25	13.15
Impact		0.02		0.02	0.03	0.03
Fairness		0.05***		0.05***	0.05***	0.07***
Percent vol		7.26*		12.72	11.52	13.78
Strain			0.10***	0.11***	0.11***	0.13***
Gender					1.33	1.73
Race					1.5	1.59
Age					0.07	0.07
Marital status					1.39	1.47
Alcoholism					0.04***	0.04**

Appendix P

Organizational Outcomes

Bold = significant at: * <=.001 ** <=.01 * <=.05**

Job Security

Variable	MODEL STEPS					
	2	3	4	5	6	7
	B	B	B	B	B	B
Downsizing ratio	18.47			18.21	18.52	18.14
Impact		0.02*		0.02	0.02*	0.03**
Fairness		0.04***		0.05***	0.05***	0.07**
Percent vol		16.13		21.5	21.68	21.14
Strain			0.09***	0.10***	0.10***	0.12*
Gender					1.37	1.63
Race					1.39	1.46
Age					0.06	0.07
Marital status					1.29*	1.33*
Alcoholism					0.04	0.04

Work Performance

Variable	MODEL STEPS					
	2	3	4	5	6	7
	B	B	B	B	B	B
Downsizing ratio	6.32**			9.48	8.79*	9.08
Impact		0.02		0.02	0.02	0.02
Fairness		0.04***		0.04***	0.04***	0.05
Percent vol		6.23		10.11	9.01	9.19
Strain			0.08***	0.09*	0.09*	0.10
Gender					1.04	1.27
Race					1.17	1.18
Age					0.05***	0.06*
Marital status					1.09	1.08
Alcoholism					0.03	0.03

Morale

Variable	MODEL STEPS					
	2	3	4	5	6	7
	B	B	B	B	B	B
Downsizing ratio	13.15*			17.87	18.94	14.43
Impact		0.03		0.03	0.03	0.03
Fairness		0.06***		0.06***	0.06***	0.07
Percent vol		12.15		20.42	21.55	15.56
Strain			0.12***	0.12***	0.13***	0.13
Gender					1.67	1.76
Race					1.75	1.62
Age					0.08	0.08
Marital status					1.62	1.49
Alcoholism					0.04	0.04